The Impact of Vehicle Tolls on Hampton Roads

THE IMPACT OF VEHICLE TOLLS ON HAMPTON ROADS: JOB MOBILITY, RESIDENTIAL LIVING CHOICES AND REGIONAL COHESION

Vehicle tolls are nothing new in Hampton Roads. Both the Downtown Tunnel (DTT), which opened in 1952, and the Midtown Tunnel (MTT), which opened in 1962, extracted 25-cent tolls from drivers of vehicles passing through them until 1986. The Virginia Beach Expressway (now I-264) opened in 1967 and was funded with tolls as high as 25 cents for passenger cars and a bit higher on a per axle basis for trucks. These tolls were removed in 1996.

The Hampton Roads Bridge-Tunnel (HRBT) extracted a $1.25 toll from automobiles between 1957 and 1976.

The Chesapeake Bay Bridge-Tunnel (CBBT) has been tolled since it opened in 1964. Currently, that toll is $13 for passenger cars for a single trip, $26 for a three-axle truck and $47 for a six-axle truck. Repeat travelers qualify for much lower tolls.

Now, we have a new set of tolls – this time on the DTT, MTT and the Martin Luther King Freeway (MLK). The tolls are designed to help pay for a $2.16 billion transportation improvement project negotiated by the Commonwealth of Virginia under the aegis of the Public/Private Partnership Act of 1995. The centerpiece of the project is a new tunnel tube for the MTT that will improve traffic flow between Norfolk and Portsmouth, as well as to points west and south. The new tube will increase the MTT to four lanes and presumably expedite traffic going to and from the Sentara/Eastern Virginia Medical School health complex, Old Dominion University, the port and Naval Base Norfolk.

More than a little controversy has accompanied this project because at least one study has suggested that the adverse impact of new vehicle tolls would be especially large for the city of Portsmouth.[1] The new tolling arrangement also has pushed to the forefront questions about the viability of any regional strategy that would pay for a new (third) crossing over the James River estuary, and perhaps even the widening of I-64 to Richmond, by means of tolls. Finally, this project has caused both members of the public and legislators to take a closer look at the Public-Private Partnership Act of 1995, which enabled the current project and its surrounding financial arrangements.

What are the new DTT, MTT and MLK tolls? While lower initially, beginning in 2016, drivers of passenger cars going through either the DTT or MTT tunnel will pay $1.84 during peak hours, while drivers of trucks will pay $7.36. During off-peak hours, they will pay $1.59 and $4.77, respectively. MLK tolls will be 50 cents for tunnel users and $1 for non-tunnel users. However, these are E-ZPass (electronic) rates and drivers of vehicles without an E-ZPass transponder will pay triple these amounts.

[1] James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014. The report may be accessed at www.jamesvkoch.com under the "Consulting Reports" icon.

The Public-Private Partnership Act Of 1995

The tolls on the DTT, MTT and MLK are one product of a 58-year "Comprehensive Agreement" between the Commonwealth of Virginia and Elizabeth River Crossing OpCo (ERCO),[2] made possible under provisions of the 1995 Public-Private Transportation Act (PPTA).[3] This particular agreement took effect in 2012 and has been amended since then.

The Comprehensive Agreement with ERCO included the construction of a second MTT tunnel tube (increasing it to four lanes), extending the MLK Freeway from High Street to I-264, and rehabilitating the existing DTT and MTT tunnels. The advertised total cost of these projects was $2.16 billion.

The primary impetus for the PPTA was the apparent inability of the Commonwealth to finance most of the large transportation infrastructure projects that legislators and citizens wished to pursue. Hence, in the PPTA, the Commonwealth turned to the private sector for help. It is not clear that, at the time, all concerned understood that private-sector investors/operators would demand a rate of return on their invested capital that would be competitive in the milieu of large, private-sector corporations. This would not be a world of 3 percent interest rates on 10-year U.S. government bonds.

The PPTA delegates responsibility for developing and approving public-private transportation partnerships to the governor, who in turn may delegate that responsibility to another individual, such as the secretary of transportation. As of this writing, approval of the Virginia General Assembly is not required, regardless of the size of the project.

ERCO is responsible for collecting tolls and for achieving the traffic volumes outlined in its forecasts, which may be a bit optimistic. While there is no guaranteed rate of return for ERCO on its investment, ERCO is authorized to earn 13.5 percent on its invested capital. If that rate of return does not materialize because competing facilities have been constructed by the Commonwealth, then the Commonwealth must compensate ERCO for the shortfall. However, if ERCO's revenues exceed forecasts (implicitly, the 13.5 percent rate of return), then ERCO will share a portion of the excess with the Virginia Department of Transportation (VDOT). The percentage share of excess gross revenues increases as the amount of gross revenues earned by ERCO increases.[4] VDOT is required by law to use the shared revenue on transportation improvements in the corridor.

The Comprehensive Agreement gives ERCO the authority to raise tolls 3.5 percent annually if it wishes to do so, beginning in 2016. However, if the annual growth rate of the consumer price index (CPI) in the preceding 12 months was higher than 3.5 percent, then ERCO may choose to increase its tolls by that percentage. Assuming that ERCO takes advantage of these provisions, **this means, at a minimum, that the peak hours and non-peak hours tolls for passenger vehicles would rise to at least $11.79 and $8.71, respectively, by 2070. (Peak hours are defined as 5:30 a.m. to 9 a.m. and 2:30 p.m. to 7 p.m.) Comparable truck tolls would rise to at least $47.17 and $30.57, respectively, by 2070. As we will soon see, because of the CPI provision, tolls actually are likely to rise much more than these amounts.**

[2] ERCO's lead firms are Skanska Infrastructure Development and Macquarie Group, both of which are public-private partnership (PPP) developers and infrastructure investors as well as operators throughout the world. For more information about ERCO, see www.erc-info.com.

[3] Among completed Virginia PPP projects are: the Pocahontas Parkway (Route 895) across the James River, south of Richmond; a 17.5-mile stretch of Route 288 west of Richmond; and the Route 199 partial loops around Williamsburg.

[4] If gross revenues exceed baseline forecasts from 5% to 10%, 10% to 20%, 20% to 30% and in excess of 30%, then VDOT will share 5%, 15%, 30% and 60%, respectively. ERCO may earn gross revenues up to 5% in excess of baseline forecasts before VDOT shares in profits.

The Positive Overall Economic Impact Of The Newly Tolled Project

There is a tendency for the supporters of toll-financed projects to neglect the costs associated with those projects and for the opponents of toll-financed projects to neglect the benefits of the same projects. Reality is that both benefits and costs are generated by toll-financed projects such as the DTT/MTT/MLK undertaking in Hampton Roads.

Let's focus for a moment on the primary benefits typically associated with a new toll project:

- Reduced travel times
- Increased trip and travel reliability
- Reduced traffic congestion
- Increased fuel economy
- Reduced vehicle operating costs
- Reduced carbon emissions and diminished environmental harm
- As many as 1,500 additional jobs and associated increased incomes connected to construction.

At least five reputable studies have documented that some or all of these benefits will be associated with the DTT/MTT/MLK tolling project. For example, The Hartgen Group estimates that after completion, the project will increase the gross regional product of Hampton Roads by an incremental $365 million to $390 million annually and in the process create 4,401 additional jobs.[5] "West Side" benefits that will accrue are estimated by Hartgen to range between $144 million and $148 million, along with 1,736 jobs. The Hartgen Group also estimated that the increased reliability of travel time across the Elizabeth River will have a median value of $63 million to the region.[6]

Reputable analysts attribute significant financial benefits to the completion of the DTT/MTT/MLK project. It also is fair to say that the analytic consensus is that the project will yield significant benefits to the region and the Commonwealth. This, however, is not the same as saying that the benefits and costs of the project will be spread evenly (or equitably) across the region, or even that the benefits and costs will be spread evenly (or equitably) among the residents and businesses inside a specific city.

We Live In An Economically Interdependent Region

Both the benefits and the costs of the DTT/MTT/MLK accruing to any city depend substantially on how many people in those cities will use these venues and end up paying tolls, either because they leave a city (perhaps Suffolk) to work in another, or because people in other cities leave those cities to come work in this city (Suffolk). Table 1 reports U.S. Census data describing where people live and where they work in Hampton Roads.

Reading down the columns, one can see to whom each city or county is supplying workers. Taking Newport News as an example, one can see that this city supplies 13,744 people who work in Hampton; 40,661 workers in Newport News remain there for their jobs; 5,236 go to work in Norfolk; 3,724 travel to work in Virginia Beach; and 15,062 workers are employed outside of Hampton Roads.

Reading across the rows, one can discover where a city or county's workers come from. Virginia Beach, for example, receives 23,138 workers from Norfolk; 6,925 from Portsmouth; 10,727 from Hampton Roads locations north of the James River;[7] and 29,576 workers from outside Hampton Roads.

[5] "Impacts of Mid-Town Tunnel Improvements on Regional Productivity and Job Mobility," The Hartgen Group (2009), p. 3, www.hartgengroup.net

[6] "Value of Improvements in the Reliability of Travel Time Resulting from MTT Improvements," The Hartgen Group (2009), p. 2, www.hartgengroup.net

[7] These workers travel to Virginia Beach from Gloucester County, James City County, Mathews County, York County, Hampton, Newport News, Poquoson and Williamsburg.

TABLE 1

WHERE PEOPLE LIVE AND WORK IN HAMPTON ROADS, 2011

Workers Live Here

Job Located In	Number of Jobs	Currituck County, N.C.	Franklin	Gloucester County	Isle of Wight County	James City County	Mathews County	Southampton County	Surry County	York County	Chesapeake	Hampton	Newport News	Norfolk	Poquoson	Portsmouth	Suffolk	Virginia Beach	Williamsburg	Outside Hampton Roads
Currituck County, N.C.	7,482	2,693	12	-	12	1	1	1	-	7	385	11	11	54	1	47	52	335	3	3,856
Franklin	13,545	20	2,847	30	860	57	20	3,329	90	47	345	60	204	194	13	355	1,372	281	-	3,422
Gloucester County	13,206	3	5	5,550	61	428	665	28	2	489	116	317	972	127	75	116	99	280	54	3,819
Isle of Wight County	14,025	36	184	20	4,265	183	38	441	320	164	547	807	1,381	285	36	731	1,836	293	20	2,435
James City County	37,618	16	38	1,363	310	12,055	286	82	329	2,869	418	1,269	4,827	347	234	356	401	757	1,130	10,532
Mathews County	2,045	4	4	267	4	28	711	-	2	37	22	37	66	13	9	7	9	17	2	808
Southampton County	3,543	4	327	4	153	4	-	1,554	40	8	46	12	20	32	1	58	120	43	1	1,116
Surry County	3,113	3	5	48	258	115	11	41	726	89	117	79	171	35	16	50	83	138	11	1,115
York County	28,992	8	28	1,695	417	3,388	208	63	74	6,067	446	2,380	5,347	428	613	428	391	828	526	5,656
Chesapeake	132,806	1,777	97	478	1,441	701	104	178	70	15	41,070	3,162	3,288	13,226	137	9,498	6,504	30,394	129	20,535
Hampton	76,504	43	40	1,130	1,717	1,833	189	70	30	5,047	3,469	23,816	13,744	3,910	1,634	1,956	2,103	5,088	213	10,471
Newport News	134,154	116	127	4,822	4,837	4,463	662	246	102	10,072	4,819	21,508	40,661	3,973	2,193	3,518	4,659	6,376	463	20,537
Norfolk	192,051	1,086	63	106	1,742	1,334	183	163	65	1,432	27,297	6,484	5,236	50,825	285	10,249	6,909	52,164	228	26,201
Poquoson	2,410	1	-	50	35	40	5	4	-	291	50	297	344	37	875	32	33	80	3	232
Portsmouth	61,237	392	50	131	1,312	255	34	92	38	304	11,722	1,721	1,881	6,044	44	16,620	5,065	8,466	38	7,027
Suffolk	37,179	155	447	222	2,074	333	40	825	101	368	4,341	885	1,355	1,710	76	3,015	12,107	2,905	29	6,193
Virginia Beach	229,365	1,621	-	612	1,329	1,130	137	179	-	1,082	25,843	3,631	3,724	23,138	196	6,925	4,790	125,237	215	29,576
Williamsburg	19,123	5	13	921	145	5,679	105	41	174	2,078	205	686	3,162	212	125	196	184	348	1,407	3,437
Outside Hampton Roads	-	5,045	2,163	2,151	320	1,935	1948.4	5,314	1,794	11,600	15,274	11,424	15,062	16,090	2,201	477	16,026	32,761	2,591	-
1,008,398		13,027	6,451	19,600	21,293	33,962	5,347	12,652	3,958	42,067	136,532	78,584	101,456	120,681	8,765	54,634	62,745	266,790	7,062	156,968

Sources: U.S. Census Bureau, 2013: OnTheMap Application. Longitudinal Employer Household Dynamics Program. http://onthemap.ces.census.gov
http://lehd.ces.census.gov/applications/help/onthemap.html#!what_is_onthemap
Jobs are "primary jobs," and include military personnel and self-employed.
Primary jobs: Public- and private-sector jobs, one job per worker. A primary job is the highest-paying job for an individual worker.
Source of jobs data: "Civilian Labor Force and Unemployment by Census Region and Division, Seasonally Adjusted," www.bea.gov

The import of the numbers in Table 1 is inescapable:

- Economically speaking, we are a highly interdependent region – most of our workers live in one city or county, but work in another. Fully 64.9 percent of our workers leave their home city or county when they go to their jobs.
- Even Norfolk, bolstered by its traditional role as a headquarters site and job magnet, finds that 57.9 percent of its employed residents work in a different city or county.
- Many of our workers "cross the water" in north-south directions. An estimated 71,000 people holding jobs in Hampton Roads cross the James River estuary every day to and from Hampton and Newport News to go to work.[8] They account for approximately 120,000 daily trips.
- Business and delivery trucks crossing the James River to and from Hampton and Newport News add approximately 70,000 daily trips to this number on a typical day.
- Many of our workers also "cross the water" in east-west directions. Roughly 85,000 people (8.5 percent) move between eastern Hampton Roads and western Hampton Roads as they travel to work. About two-thirds of them utilize the DTT and/or MTT when they do so. This activity accounts for approximately 140,000 daily trips.
- Business and delivery trucks (for example, those emanating from the port) add an approximate additional 75,000 trips to this east-west number.[9]

Some important deductions spring from these data. **Approximately 25 percent of all workers in the region are tied to jobs that require them to commute over bridges and tunnels to their jobs, or whose jobs require them to make business and delivery trips that utilize the same crossings. To the extent that drivers must pay high tolls when they utilize these venues, we risk dividing our region into three parts: Eastern Hampton Roads (Norfolk and Virginia Beach), Western Hampton Roads (Portsmouth, Suffolk and points west) and the Peninsula.** Only Chesapeake would appear to be situated in such a way that its drivers would not have to access the DTT and MTT with any frequency. However, Chesapeake drivers, like all others Southside, would have to pay to get to the Peninsula if those crossings were to become tolled.

Nearly two and a half centuries ago, in 1776, Adam Smith, in his "An Inquiry into the Nature and Causes of the Wealth of Nations," noted how the division and specialization of labor and general economic prosperity were tied to the size of available markets. This is among the reasons Smith was a free trader. He objected to tariffs and taxes that prevented consumers and businesses from making mutually profitable connections. A toll may be viewed as a tariff (tax) on movement. Were he alive today, Smith likely would eschew tolls in favor of other means of funding road, bridge and tunnel improvements.

If we impose high tolls on bridges and tunnels in Hampton Roads and separate our regional market into three distinct and perhaps competing parts, then there will be consequences. **The size of our labor pool will shrink as workers decline to pay the tolls necessary to commute over bridges and tunnels. This will mean some employees will have to settle for lower wages and some employers won't be able to hire the best possible employees. Businesses will find that the number of customers to whom they have easy access will decline. Customers will have an incentive to find alternate, less expensive suppliers, perhaps using the Internet to fuel their searches. This is a recipe for economic decline.**

[8] Approximately 20 percent of individuals utilize car pools or public transportation, or telecommute, thus reducing the actual number of trips undertaken.

[9] The business and delivery trip estimates are based upon the Koch study cited in footnote 1 and are based upon, inter alia, an actual physical count of the types of vehicles entering the DTT and MTT.

How high is "high" when we are talking about tolls? In 2016, drivers of passenger cars will pay $1.84 during peak hours to drive through either the DTT or MTT. Workers/drivers that do so twice a day, 250 days per year (and perhaps throw in a couple of more passages per month for other purposes) will spend about $1,000 per year on these tolls. This is approximately 2.2 percent of the median household income in the cities of Portsmouth and Norfolk and, based upon studies in other metropolitan areas, it is sufficient to change behavior. Tolls that extract 1 percent or less of median household income annually appear to be regarded by most drivers as a nuisance, but do not often change decisions about where they choose to work, live or spend leisure time.

The Relative Burden Of The Tolls

Only a brief glance at the Table 1 commuting matrix is needed to see that the imposition of tolls on the DTT, MTT and MLK will not have much impact on the Peninsula. It's true that 1,721 Hampton residents commute to Portsmouth for their jobs and 1,956 Portsmouth residents commute to Hampton for their work. Some of these 3,677 people may have to pay the tolls, though many of them may choose the "back side" commuting path of some combination of I-664, I-264, State Route 164 and U.S. Route 17 to travel to their jobs. Virtually all who reside in Newport News or to the north will be able to exercise the same, toll-free option.

Not surprisingly, the primary burden of the tolls will fall upon four Southside cities: Norfolk, Portsmouth, Suffolk and Virginia Beach. Of these cities, easily the largest burden will fall upon those who live or work in Portsmouth and must travel back and forth through the DTT or MTT to get to their jobs and return home.

Table 1 illustrates Portsmouth's exposed situation. Fully 10,249 people live in Portsmouth and work in Norfolk; 6,044 do the reverse. Another 6,925 people live in Portsmouth and work in Virginia Beach, while 8,466 reverse that flow. When one adds the very few individuals that live or work in Chesapeake or Currituck County, but nevertheless use the DTT and MTT, a total of 32,279 people likely will use the DTT and MTT to go to work in and out of Portsmouth.

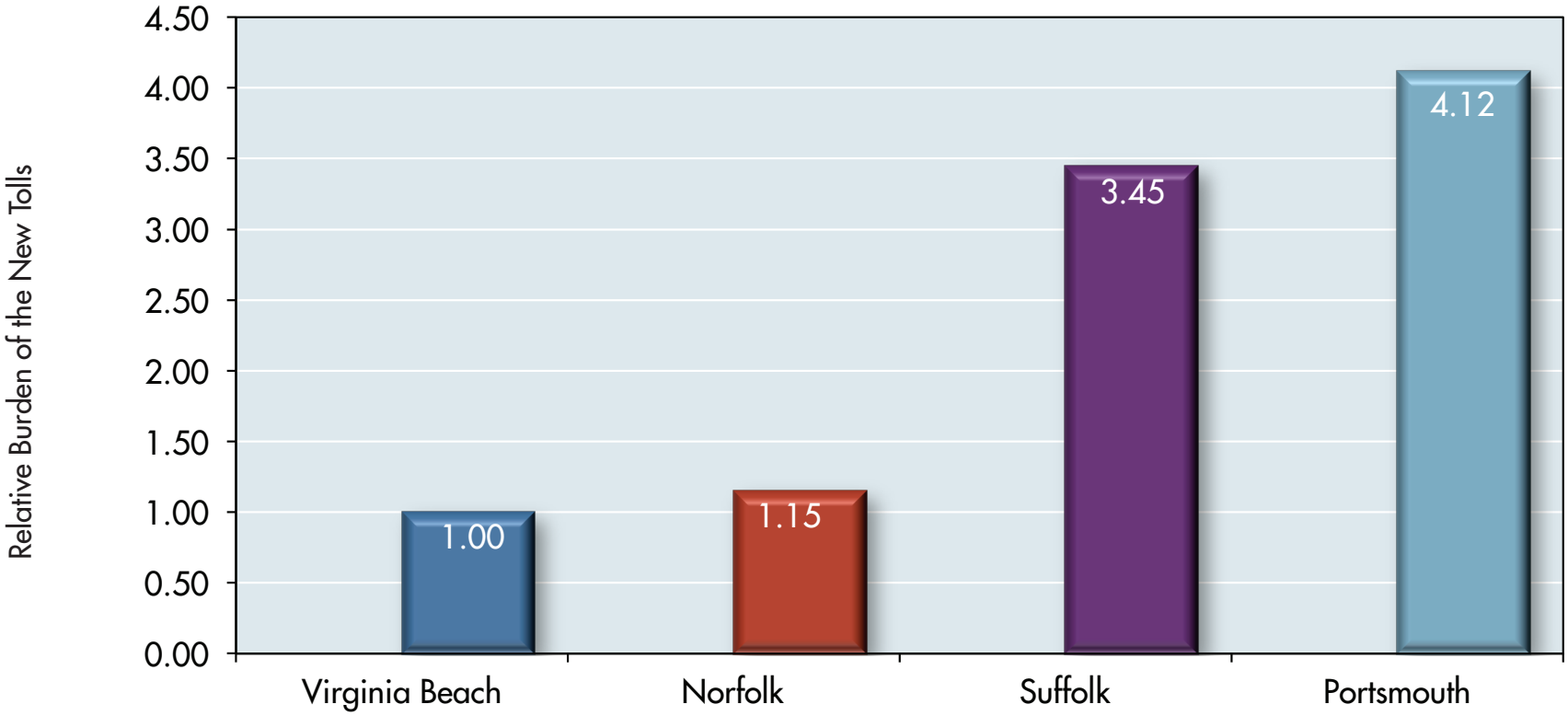
Portsmouth's job base of 61,237 is an approximate measure of the size of its economy. A rough-and-ready measure of the impact of the new tolls on Portsmouth is the percentage (52.7 percent) of the city's "in and out" commuters among its job base.

How does this compare to the other Southside cities that primarily will be affected by the tolls? Graph 1 indexes the impact the tolls will have on Norfolk, Portsmouth, Suffolk and Virginia Beach as the percentage of each city's job base consisting of "in and out" commuters that must use the DTT and MTT to go back and forth to work. The impact is least on Virginia Beach. While Table 1 discloses that an estimated 6,925 + 8,466 = 15,391 people will be "in and out" commuters to and from Virginia Beach and Portsmouth, Suffolk and points west (and hence probably must use the DTT and MTT), this is only 6.7 percent of Virginia Beach's substantial job base of 229,365.

Graph 1 indexes Virginia Beach's percentage at 1.00. Norfolk slides in above Virginia Beach with an index of 1.15, followed by Suffolk at 3.45 and Portsmouth at 4.12. In relative terms, the impact of the tolls will be more than four times greater upon Portsmouth than on Virginia Beach. The relative impact of the DTT and MTT tolls upon Chesapeake and the cities and counties on the Peninsula is minuscule by comparison.

GRAPH 1

RELATIVE BURDEN OF THE NEW TOLLS UPON SOUTHSIDE HAMPTON ROADS CITIES



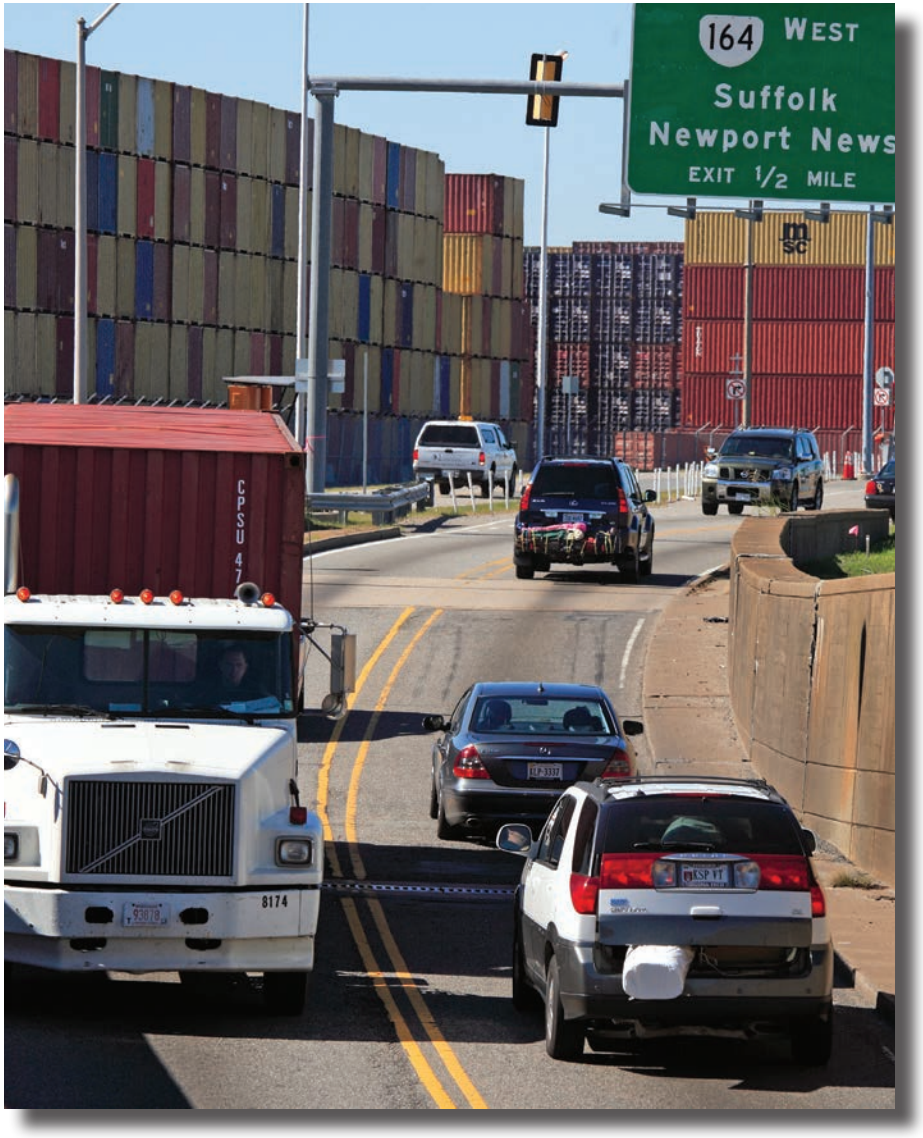
Source: James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014

Future Increases In Tolls For The DTT And MTT

The Commonwealth's agreement with Elizabeth River Crossings permits ERCO to increase tolls by 3.5 percent annually, or the growth in the consumer price index over the trailing 12 months, if that is higher. As Graph 2 illustrates, this means that the $1.84 peak-time toll for passenger cars would increase to $11.79 in 2070 if tolls increased at only 3.5 percent annually, but would jump to $21.56 if the growth in the CPI between now and 2070 matched what was true between 1956 and 2014. During that 58-year time period, the annual growth in the CPI was higher than 3.5 percent on 24 occasions.

Specifically, past CPI growth suggests that tolls will increase at an average of 4.66 percent per year, not 3.5 percent. Thanks to the miracle of compound growth, this would increase ERCO's total revenue by slightly more than 82 percent over the 3.5 percent scenario.[10]

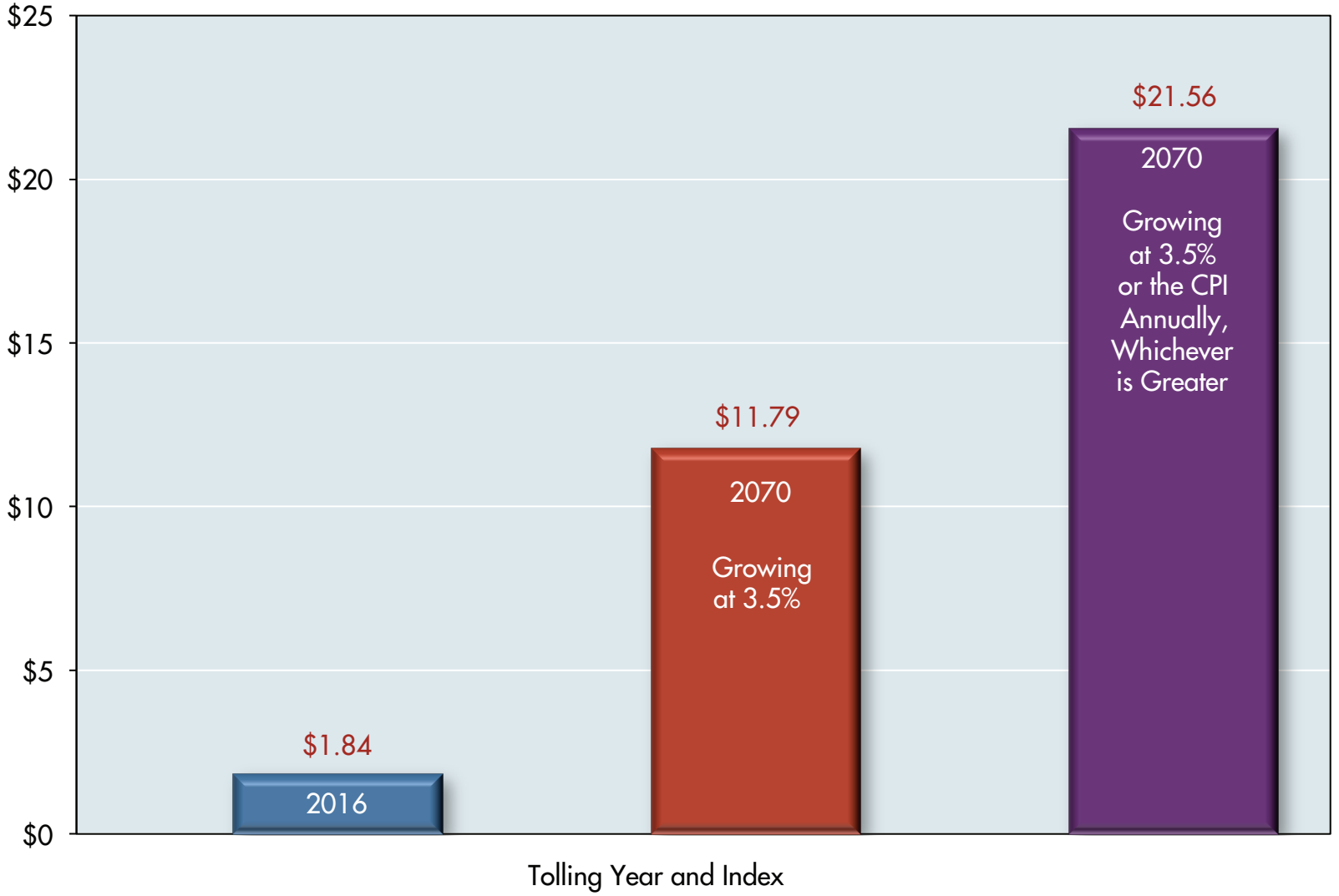
Graph 3 reveals that the $7.36 peak-hour toll that trucks will pay in 2016 will grow to $47.17 if tolls increase at only 3.5 percent annually, but to a stupendous $86.24 if they grow at the aforementioned 4.66 percent annually. It is not difficult to envision a scenario in which such tolls inhibit economic activity in Hampton Roads.



[10] James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014.

GRAPH 2

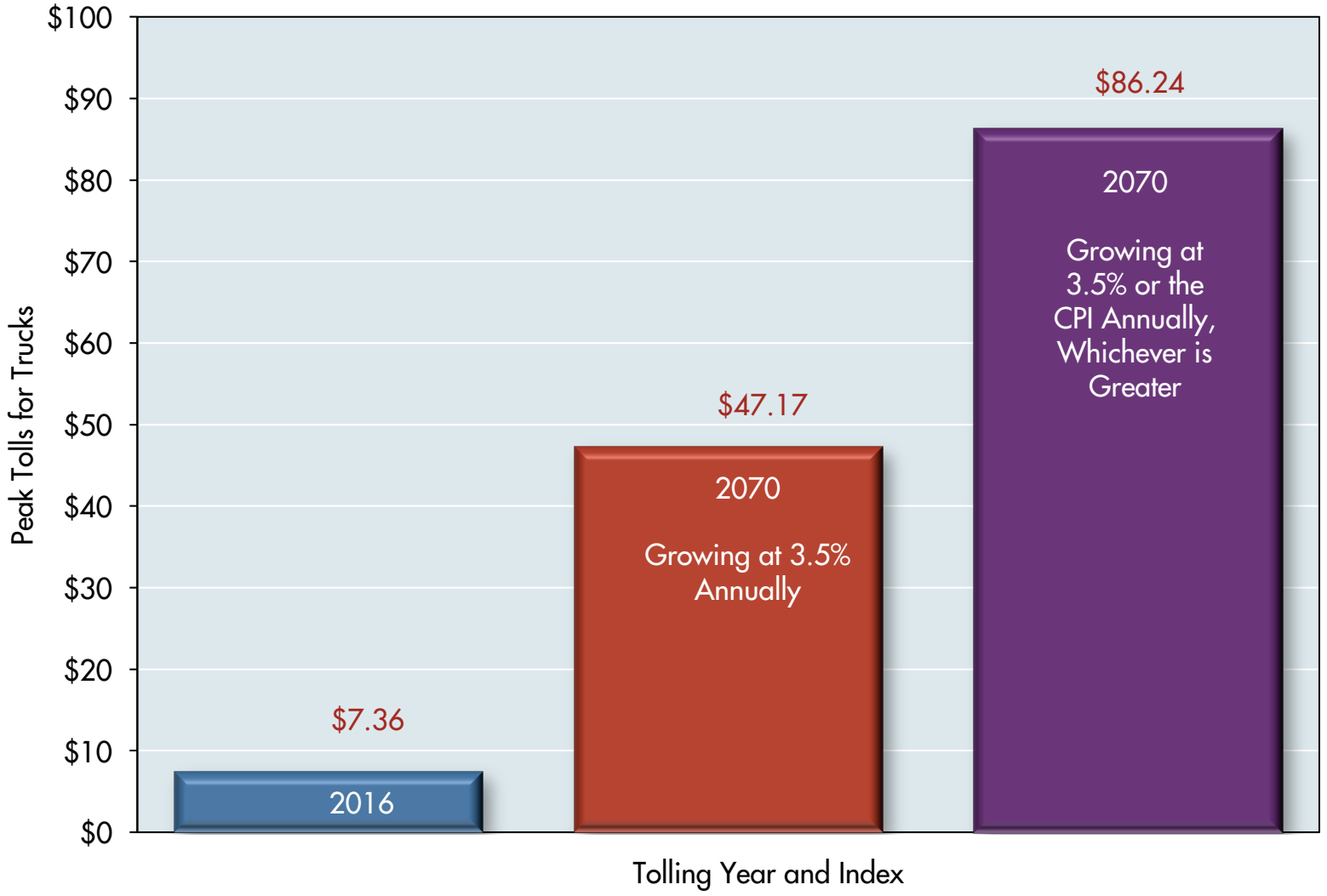
GROWTH OF PASSENGER VEHICLE TOLLS, 2016 THROUGH 2070
(ASSUMING ANNUAL INCREASES OF 3.5 PERCENT OR THE CPI, WHICHEVER IS GREATER)



Source: James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014

GRAPH 3

GROWTH OF TRUCK TOLLS, 2016 THROUGH 2070
(ASSUMING ANNUAL INCREASES OF 3.5 PERCENT OR THE CPI, WHICHEVER IS GREATER)



Source: James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014

The Key Role Of Discretionary Drivers

Table 2 reveals that 32,279 people potentially will go "in and out" of Portsmouth daily because of their jobs. If they make round trips, this means there are 64,558 potential trips made daily through the tunnels by workers. Some, however, will carpool; others will use mass public transportation. Still others may telecommute. Based upon the experience of other metropolitan areas, 20 percent is an approximate estimate of the number of people that will utilize these alternatives.

An estimated 25,000 vehicle trips through the tunnels reflect trucks and business vehicles plying their trades on a daily basis. Since the average number of total trips through the two tunnels is approximately 125,000 (about 70 percent through the DTT), this leaves approximately 50,000 "discretionary" trips daily that do not relate to job commuting or the activities of businesses.[11] It is these individuals who are most likely to be negatively influenced by the new tolls. They are people who drive through the tunnels for sundry purposes – shopping, recreation, excursions to restaurants and churches, visits to friends and transit to other locales.

Discretionary drivers are more likely to utilize the tunnels during non-peak hours because they have no need to drive during the most congested and more expensive peak hours (5:30 a.m. to 9 a.m. and 2:30 p.m. to 7 p.m.). Preliminary evidence on tunnel traffic immediately after the imposition of tolls on Feb. 1, 2014, revealed that the decline in traffic was much larger during non-peak hours than peak hours (Dave Forster, "Traffic Surges to Gilmerton, High-Rise After Tunnel Tolls," The Virginian-Pilot, Feb. 14, 2014). This is precisely the reaction one would expect. Those that don't really need to pay the tolls are the ones most likely to decide to stay home, or to relocate their activities closer to their home bases.

[11] James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014.

TABLE 2

SUMMARY COMMUTING MATRIX FOR PORTSMOUTH, 2011

Downtown and Midtown Only

	From Portsmouth	Into Portsmouth
Chesapeake	95	117
Norfolk	10,249	6,044
Virginia Beach	6,925	8,466
Currituck County, N.C.	24	196
Outside Hampton Roads	24	351
Totals	17,317	15,174

"In and Out" total is 32,491, which is 53.1 percent of Portsmouth's job base of 61,237.

All Tolled: DTT, MTT, HRBT, MMMBT, RT17

	From Portsmouth	Into Portsmouth
Chesapeake	95	117
Norfolk	10,249	6,044
Virginia Beach	6,925	8,466
Currituck County	24	196
Gloucester County	116	131
Mathews County	7	34
York County	428	304
Hampton	1,956	1,721
Newport News	3,518	1,881
Poquoson	32	44
Williamsburg	196	38
Outside Hampton Roads	95	1,405
Totals	23,641	20,381

"In and Out" total is 44,022, which is 71.9 percent of Portsmouth's job base of 61,237.

Note: Downtown Tunnel (DTT), Midtown Tunnel (MTT), Hampton Roads Bridge-Tunnel (HRBT), Monitor-Merrimac Memorial Bridge-Tunnel (MMMBT) and James River Bridge (RT17)
Source: James V. Koch, "The Differential Impact of Tolls on the City of Portsmouth," Jan. 6, 2014

To the extent that discretionary drivers avoid the tolled tunnels, this will inflict financial injury upon Southside businesses that have regional rather than local clienteles. Consider a restaurant in Olde Towne Portsmouth, an area that attracts a significant portion of its guests from outside of the city. Suppose the average tab paid by a diner is $35 (counting both lunch and dinner). Then, in 2016, the $1.84 x 2 = $3.68 tolls paid by the diner would be equivalent to a 10.5 percent tax on that dining experience. This is not a recipe for success. Contemporary estimates of "price elasticity of demand" (the sensitivity of consumers to price changes) suggest that such a 10.5 percent increase in price because of the tolls would result in an 8 percent to 12 percent decline in sales revenue (holding everything else, such as Department of Defense expenditures and general prosperity, constant).

The financial injury does not end there. Let's once again focus on Portsmouth. Each 1 percent decline in sales tax collections will cost the city of Portsmouth $6 million annually. Further, declining sales and profits eventually will reduce the value of the city's businesses and the properties where they are located. Each 1 percent decline in the assessed valuation of properties in the city of Portsmouth will reduce its tax collections by about $900,000. Of course, Portsmouth's loss could become another city's gain.

While Portsmouth is the Southside city most vulnerable to the tolls, other cities such as Norfolk also attract many of the discretionary drivers that utilize the tunnels to travel to businesses and restaurants in Norfolk, patronize regional attractions such as the Chrysler Museum of Art, the Norfolk Tides and the Norfolk Admirals, or drive to educational institutions such as Tidewater Community College, Norfolk State University and Old Dominion University. Indeed, because of its long-standing status as a cultural, legal, financial and educational center for Hampton Roads, Norfolk appears to attract a higher proportion of discretionary travelers than any other city in the region. Hence, it will not escape the burden of the tolls.

Future Traffic Volumes Through The DTT And MTT

Estimation of traffic volumes when new tolls are imposed upon a travel venue is somewhat speculative simply because the tolls represent something entirely new as opposed to an increase in price of something that already exists. The Commonwealth commissioned several consultants and agencies to provide traffic estimates through the DTT and MTT. Among them was Steer, Davies and Gleave, whose 2010 report and final report in March 2012 estimated traffic flows through 2070: "Downtown Tunnel/Midtown Tunnel/Martin Luther King Freeway (MLK) Extension: Traffic and Revenue Forecasts."

Steer, Davies and Gleave opined that a 24 percent to 48 percent immediate decline in tunnel traffic might occur because of a "shock effect." The actual declines in tunnel traffic that occurred in February 2014, while substantial, were not this large. The consulting firm predicts slow, gradual growth in traffic once drivers adjust to tolls.

"Drop in Traffic Takes Toll on Investors in Private Roads," reported The Wall Street Journal on Nov. 20, 2013. The WSJ's Ryan Dezember and Emily Glazer noted that traffic volume projections often have been overly optimistic on privately owned or operated toll projects.

Straightforward economic analysis suggests that the typical passenger car driver eventually will decide to pay the tolls. Suppose the value of a driver's time is $10 per hour and that avoiding the tunnels adds 30 minutes to the length of a trip across the Elizabeth River. The value of those extra 30 minutes to this typical driver is .5($10) = $5, which is substantially higher than either the $1 toll in 2014, or the $1.84 toll in 2016. Hence, an armchair prediction is that the typical driver will grumble and perhaps attempt to minimize his/her trips, but ultimately will decide that driving through the tunnels

(and paying the tolls) is cost efficient after all. Still, this will be less true for discretionary drivers than for job commuters and businesses.

Nightmare On Elm Street: Tolling The James River Crossings

> *"My recommendation would be to toll all 4 crossings with electronic toll collection, with dynamic pricing (congestion pricing, with all the revenues utilized only on the 4 crossings) based on time-of-day and day-of-week, designed to optimize the usage of all 4 crossings, with a price structure that would pay for the entire total cost (debt service on toll revenue bonds) of the Third Hampton Roads Crossing project, justifying the re-tolling of the JRB and HRBT on the basis that the Third Crossing would provide them traffic relief as well as revenues for maintenance, and for providing an adjustable optimal traffic balance over all 4 crossings."* Scott M. Kozel, "Roads to the Future," April 10, 2005, http://www.roadstothefuture.com/HR_Crossing_Study.html#PPP-2001

If placing tolls on the DTT, MTT and MLK has generated problematic results, then consider what would happen if all vehicles using the three major un-tolled James River crossings (the Route 17 Bridge, the Monitor-Merrimac Memorial Bridge-Tunnel and the Hampton Roads Bridge-Tunnel) were subjected to tolls. These three James River crossings (which we abbreviate as RT17, MMMBT and HRBT, respectively) likely would be tolled if a third crossing over the James River were constructed. A third crossing would have cost $2.7 billion a decade ago and quite simply neither the Commonwealth nor the region possessed such a revenue source.

Refer back to the commuting matrix data found in Table 1. Let's use Hampton as an instructive example. As Table 3 reveals, a total of 15,883 people live in Hampton, but are employed in the five major Southside cities: Chesapeake, Norfolk, Portsmouth, Suffolk and Virginia Beach. It would be nearly impossible for these commuters to avoid paying tolls unless they carpool, use mass transportation or telecommute. There also is a reverse flow: 16,526 people live in one of the five Southside cities, but are employed in Hampton. Hence, a total of 32,409 people with connections to Hampton would be affected by tolls on RT17, MMMBT and HRBT. The comparable number for Newport News is 38,829. The total for the two Peninsula cities is 71,238.

Thus, 71,238 is the average daily number of people who live in either Hampton or Newport News, but are employed Southside *plus* those people that live Southside, but are employed in either Hampton or Newport News.[12] Most of these people would pay a toll – twice a day – if RT17, the MMMBT and the HRBT were tolled in order to pay for a third crossing.

If approximately 20 percent of these commuters carpool, use mass transportation or telecommute, then we still are left with about 57,000 vehicles that cross the James River each day because of their employment. Add to this perhaps 25,000 daily business trips and about the same number of discretionary trips, and the total average estimated trips nears 110,000.

[12] Note that there are other people who live or work in locations such as Poquoson, James City County and Williamsburg that also commute across the James River.

TABLE 3 WORKERS CROSSING THE JAMES RIVER ON A DAILY BASIS: THE FLOW OF MAJOR CITY WORKERS OVER THE RT17 BRIDGE, MMMBT AND HRBT				
Hampton to Chesapeake	3,162		Chesapeake to Hampton	3,469
Hampton to Norfolk	6,484		Norfolk to Hampton	3,910
Hampton to Portsmouth	1,721		Portsmouth to Hampton	1,956
Hampton to Suffolk	885		Suffolk to Hampton	2,103
Hampton to Virginia Beach	3,631		Virginia Beach to Hampton	5,088
Totals	15,883			16,526
Hampton Total: 32,409				
Newport News to Chesapeake	3,288		Chesapeake to Newport News	4,819
Newport News to Norfolk	5,236		Norfolk to Newport News	3,973
Newport News to Portsmouth	1,881		Portsmouth to Newport News	3,518
Newport News to Suffolk	1,355		Suffolk to Newport News	4,659
Newport News to Virginia Beach	3,724		Virginia Beach to Newport News	6,376
Totals	15,484			23,345
Newport News Total: 38,829				
To the Southside Total	31,367		To the Peninsula Total	39,871
Grand Total, "to and from": 71,238				
Source: James V. Koch, "The Different Impact of Tolls on the City of Portsmouth," Jan. 6, 2014				

One can quibble with the precise nature of these estimates; they are approximations. Even so, the broad lessons of these numbers can be grasped easily. The cities and counties of our region are highly interdependent. **Anything that reduces or frustrates this economic interdependence will make us worse off. Significant tolls on the three currently non-tolled James River crossings would fall into that category because they would increase costs, diminish the size of our market, reduce labor mobility and cause our incomes to stagnate or decline. Viewed from a national perch, significant James River tolls would do much to make our region noncompetitive.**

Summing It Up

A variety of independent studies have predicted that the overall economic impact of the DTT/MTT/MLK project on Hampton Roads will be positive. These studies rely upon "present value" estimates that collapse future revenues and costs into current dollars so that, for example, costs and revenues in 2040 can be compared to costs and revenues in 2016. This is conventional practice in economics and finance, and the studies cannot be faulted for their methodology. The conclusion, however, is that this project, when completed, will be good for our region.

However, a finding that discounted benefits of the project exceed its discounted costs for Hampton Roads as a region does not guarantee that all cities and counties in our region will experience the same proportionate benefits and costs. Indeed, perhaps the most important lesson here is that the benefits and costs of the project are unequally distributed across Hampton Roads. Much depends upon the locations where people actually live and work, which businesses and institutions attract out-of-town customers and guests, and the behavior of discretionary drivers.

Norfolk, Portsmouth and Suffolk are the cities most affected by the tolls. Portsmouth in particular appealed to the Commonwealth for relief, and Gov.

Terry McAuliffe delayed the full onset of the tolls until 2016 by providing the project with what has been advertised as $82 million in toll revenue subsidies. Prospects for significant long-term financial assistance to the cities are not good, however.

Accordingly, the cities should consider:

- **Subsidizing or rebating portions of tolls paid by citizens or employees.** Moffatt and Nichols' useful 2012 report to Portsmouth focused on ways that this city itself might subsidize or rebate toll payments.[13] The cities should consider jointly advocating a state income tax credit for cumulative tolls paid by an individual above a certain level, say, $250 annually. This tax credit easily could be tied to the size of someone's taxable income in order to focus it upon lower-income individuals and households. This would constitute a drain on the Commonwealth's treasury, but the drain would be much smaller and more distributed over time than, say, a request for an additional $100 million in cash or debt contribution by the Commonwealth to the project. This might appeal to toll payers elsewhere in the Commonwealth. The cities also could rebate their own property taxes and the like on much the same basis.

- **Additional tolling time periods**. Daily vehicle traffic through the DTT and MTT varies up to 30 percent during a typical week and much more than this during a single day. ERCO has responded to these data by developing a two-time period model – peak hours and non-peak hours – in terms of the tolls it will charge. Experience at other toll sites nationally suggests that as many as four distinct tolling time periods may be optimal.

  Additional tolling time periods would not cost ERCO revenue if the demand for tolled travel were "unit elastic" or better. Practically, this means that a 10 percent reduction in tolls must result in a more than 10 percent increase in toll customers, or a 20 percent reduction in tolls must cause a more than 20 percent increase in toll customers.

  The cities should request that ERCO experiment with additional tolling time periods to determine the reaction of drivers. The aim would be to attract more discretionary drivers (for example, those who might patronize a store or restaurant, attend church or visit friends).

- **Enhanced public transportation.** The cities should do their utmost to publicize Hampton Roads Transit's Traffix website, www.gohrt.com/services/traffix, where prospective car poolers can make contact with each other. A three-person car pool slices two-thirds of the cost from the tolls paid by a single passenger vehicle. Further, the cities should explore additional Elizabeth River bus and ferry service with HRT.

[13] "City of Portsmouth Policy and Legislative Recommendations: Midtown and Downtown Tunnel Toll Implementation," Moffatt and Nichols, Aug. 27, 2012.